FIG. 1

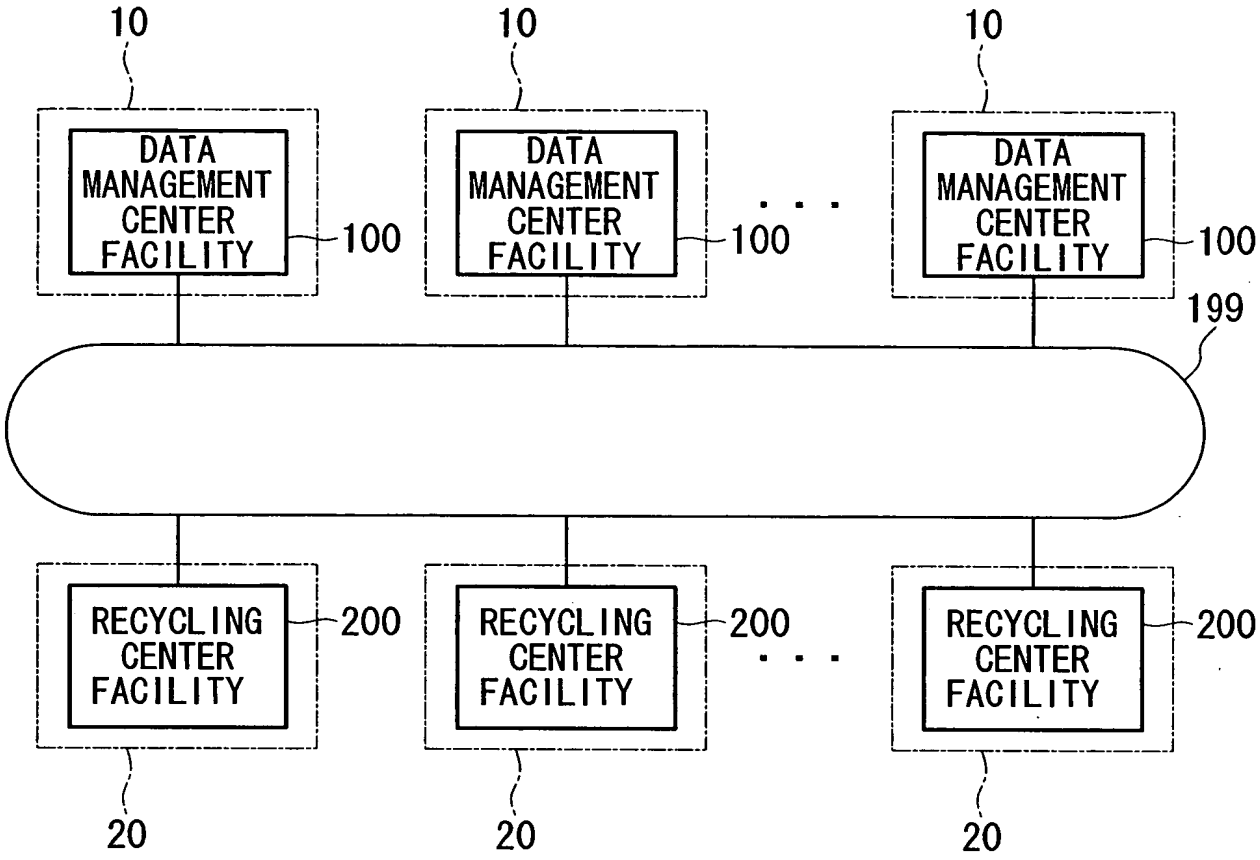
10
10
10
DATA MANAGEMENT CENTER FACILITY
100
DATA MANAGEMENT CENTER FACILITY
100
DATA MANAGEMENT CENTER FACILITY
100
199
RECYCLING CENTER FACILITY
200
RECYCLING CENTER FACILITY
200
RECYCLING CENTER FACILITY
200
20
20
20

FIG. 2

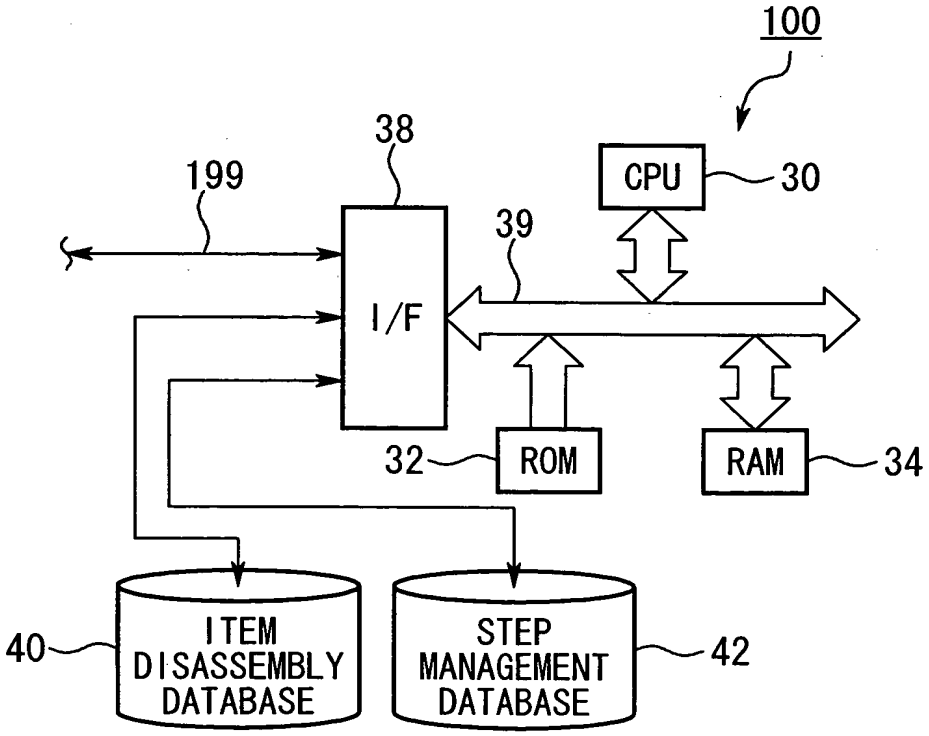
100
38
199
CPU
30
39
I/F
32
ROM
RAM
34
40
ITEM DISASSEMBLY DATABASE
STEP MANAGEMENT DATABASE
42

FIG. 3

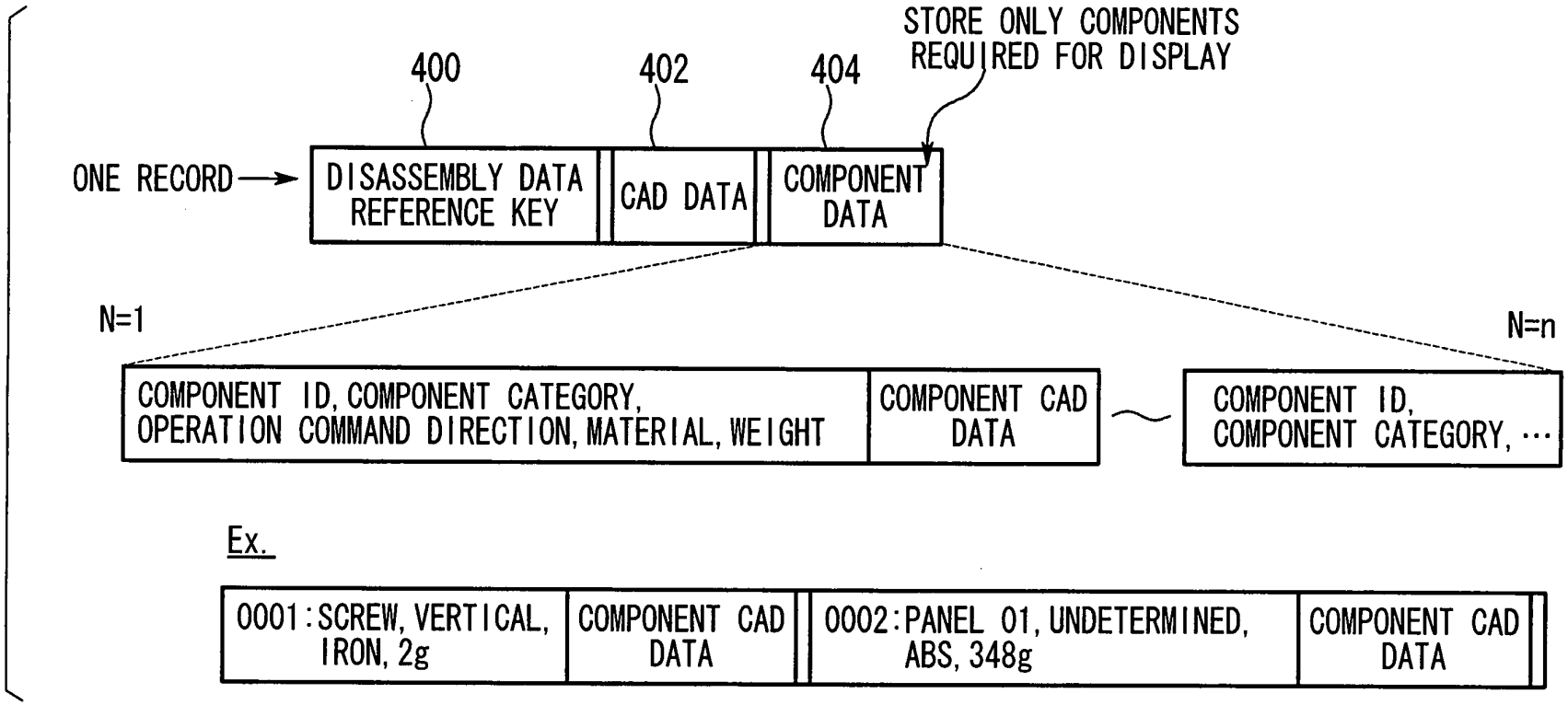
STORE ONLY COMPONENTS REQUIRED FOR DISPLAY
400
402
404
ONE RECORD
DISASSEMBLY DATA REFERENCE KEY
CAD DATA
COMPONENT DATA
N=1
N=n
COMPONENT ID, COMPONENT CATEGORY, OPERATION COMMAND DIRECTION, MATERIAL, WEIGHT
COMPONENT CAD DATA
COMPONENT ID, COMPONENT CATEGORY, ···
Ex.
0001:SCREW, VERTICAL, IRON, 2g
COMPONENT CAD DATA
0002:PANEL 01, UNDETERMINED, ABS, 348g
COMPONENT CAD DATA

FIG. 4

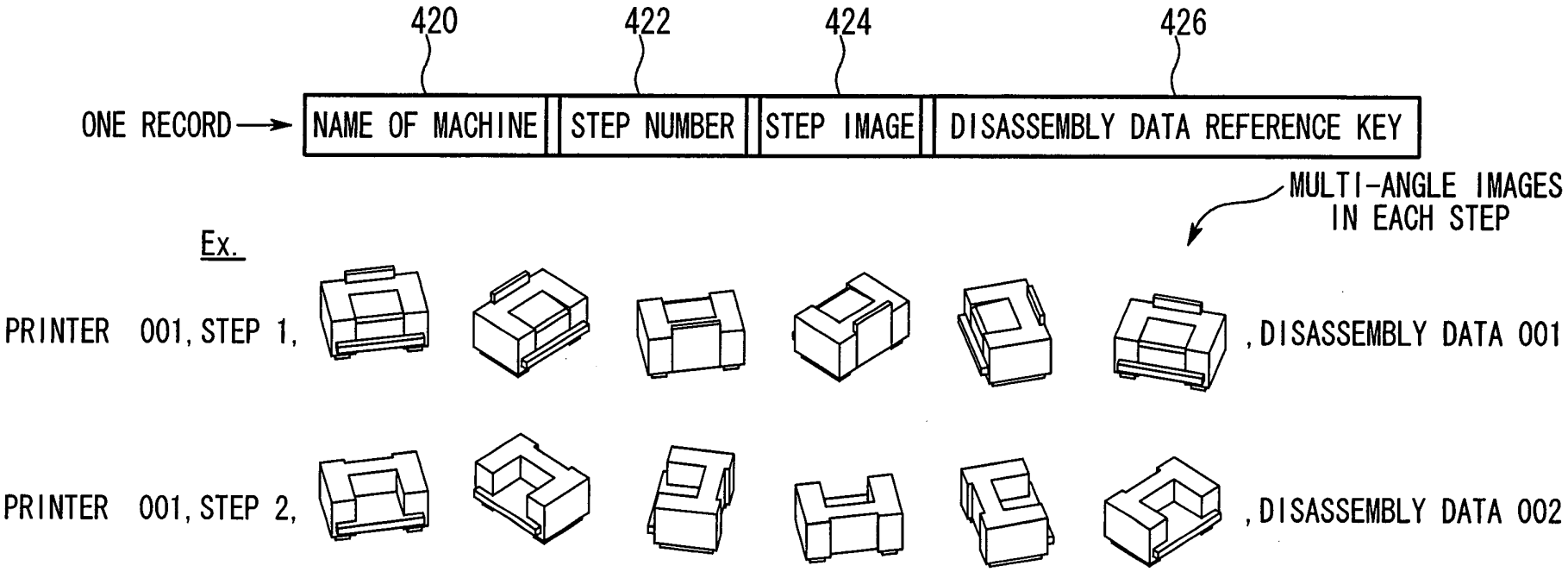
420
422
424
426
ONE RECORD
NAME OF MACHINE
STEP NUMBER
STEP IMAGE
DISASSEMBLY DATA REFERENCE KEY
MULTI-ANGLE IMAGES IN EACH STEP
Ex.
PRINTER 001, STEP 1,
, DISASSEMBLY DATA 001
PRINTER 001, STEP 2,
, DISASSEMBLY DATA 002

FIG. 5

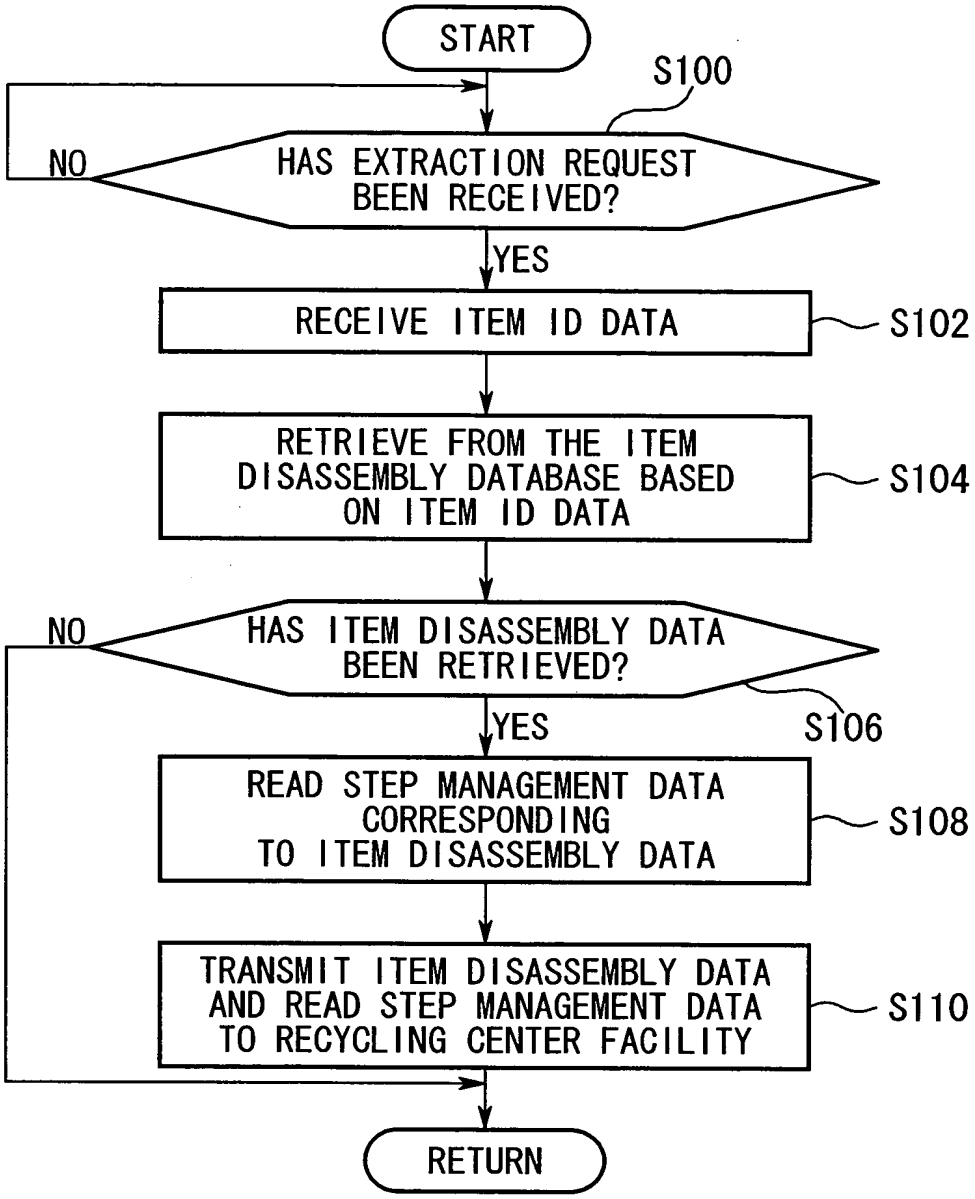
START
S100
NO
HAS EXTRACTION REQUEST BEEN RECEIVED?
YES
RECEIVE ITEM ID DATA
S102
RETRIEVE FROM THE ITEM DISASSEMBLY DATABASE BASED ON ITEM ID DATA
S104
NO
HAS ITEM DISASSEMBLY DATA BEEN RETRIEVED?
S106
YES
READ STEP MANAGEMENT DATA CORRESPONDING TO ITEM DISASSEMBLY DATA
S108
TRANSMIT ITEM DISASSEMBLY DATA AND READ STEP MANAGEMENT DATA TO RECYCLING CENTER FACILITY
S110
RETURN

FIG. 6

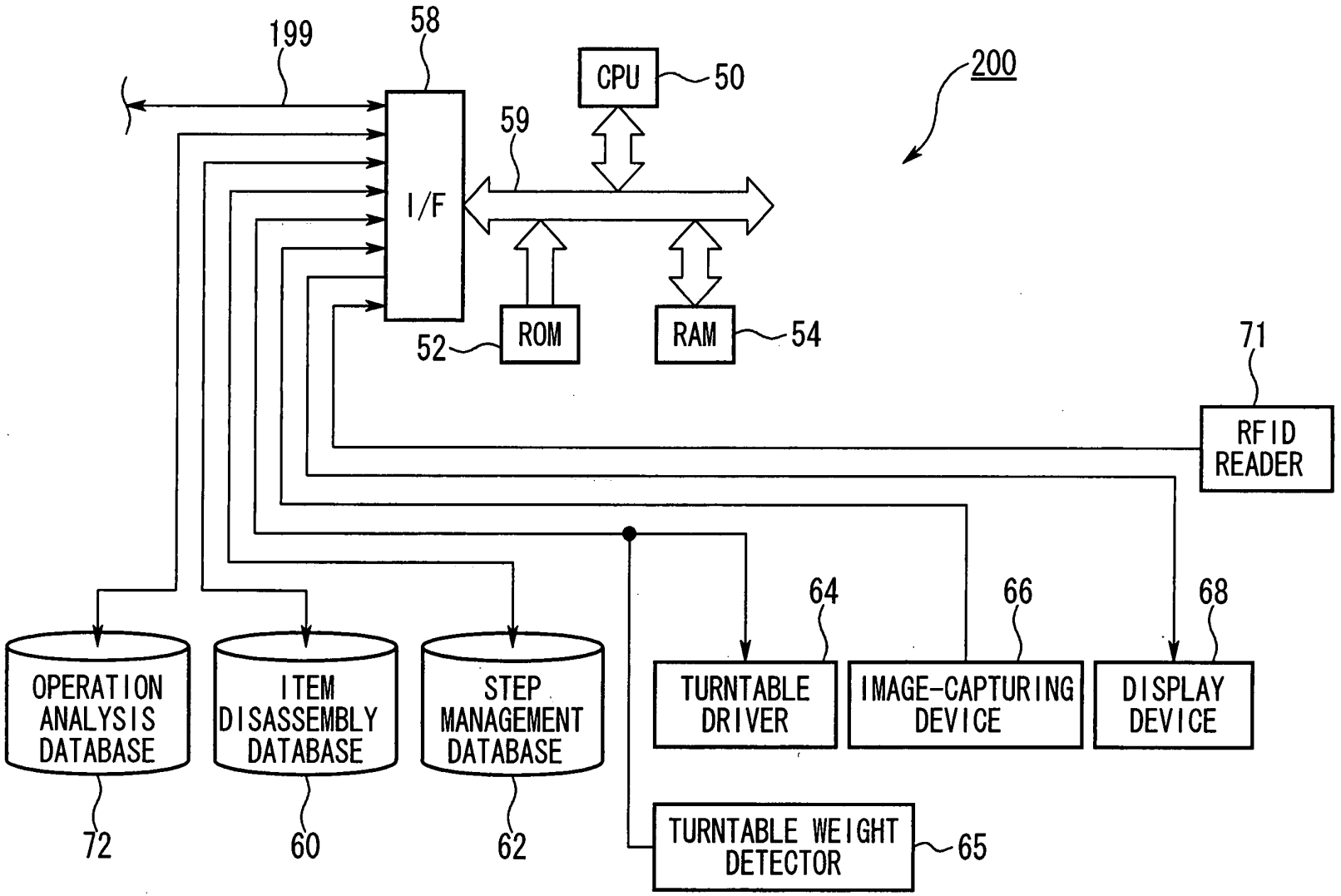
199
58
CPU
50
200
59
I/F
ROM
52
RAM
54
71
RFID READER
OPERATION ANALYSIS DATABASE
ITEM DISASSEMBLY DATABASE
STEP MANAGEMENT DATABASE
64
TURNTABLE DRIVER
66
IMAGE-CAPTURING DEVICE
68
DISPLAY DEVICE
72
60
62
TURNTABLE WEIGHT DETECTOR
65

FIG. 7

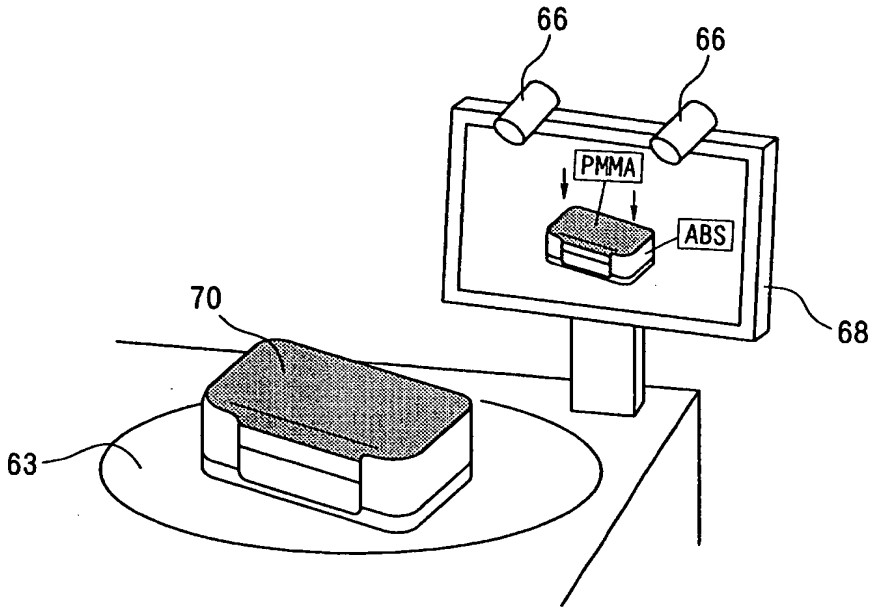

FIG. 8

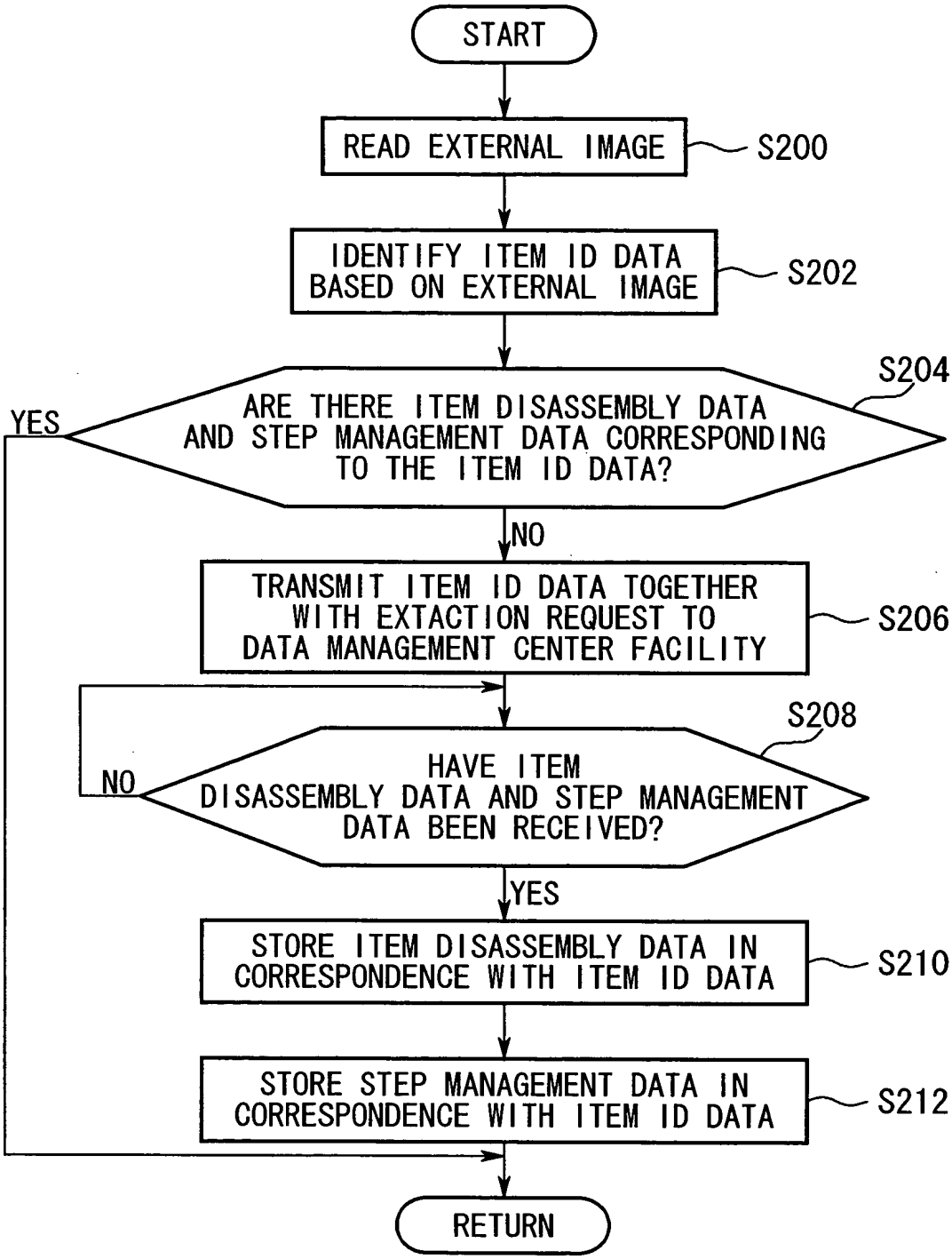
START
READ EXTERNAL IMAGE
S200
IDENTIFY ITEM ID DATA BASED ON EXTERNAL IMAGE
S202
S204
ARE THERE ITEM DISASSEMBLY DATA AND STEP MANAGEMENT DATA CORRESPONDING TO THE ITEM ID DATA?
YES
NO
TRANSMIT ITEM ID DATA TOGETHER WITH EXTACTION REQUEST TO DATA MANAGEMENT CENTER FACILITY
S206
S208
HAVE ITEM DISASSEMBLY DATA AND STEP MANAGEMENT DATA BEEN RECEIVED?
NO
YES
STORE ITEM DISASSEMBLY DATA IN CORRESPONDENCE WITH ITEM ID DATA
S210
STORE STEP MANAGEMENT DATA IN CORRESPONDENCE WITH ITEM ID DATA
S212
RETURN

FIG. 9

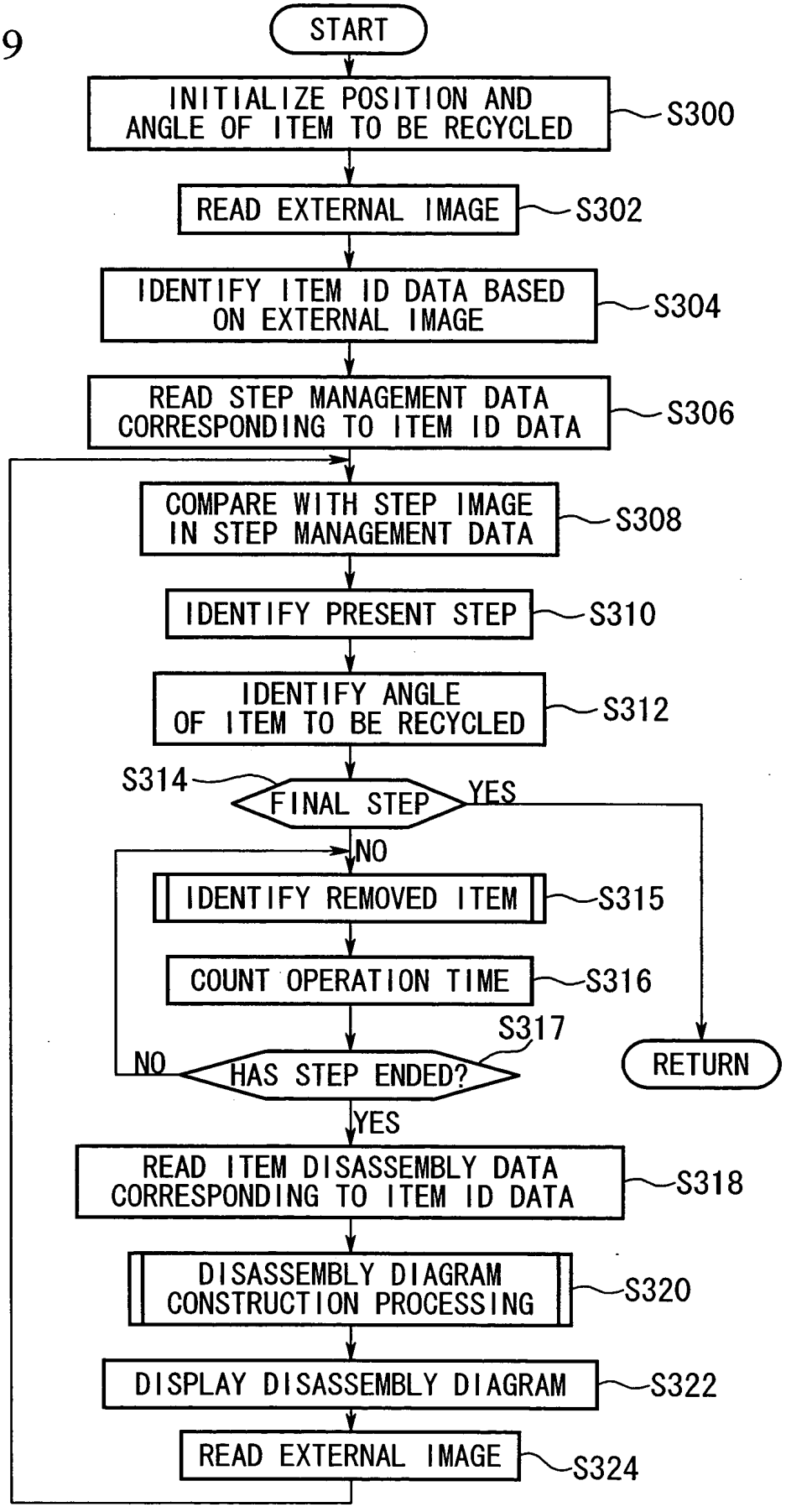
START
INITIALIZE POSITION AND ANGLE OF ITEM TO BE RECYCLED
S300
READ EXTERNAL IMAGE
S302
IDENTIFY ITEM ID DATA BASED ON EXTERNAL IMAGE
S304
READ STEP MANAGEMENT DATA CORRESPONDING TO ITEM ID DATA
S306
COMPARE WITH STEP IMAGE IN STEP MANAGEMENT DATA
S308
IDENTIFY PRESENT STEP
S310
IDENTIFY ANGLE OF ITEM TO BE RECYCLED
S312
S314
FINAL STEP
YES
NO
IDENTIFY REMOVED ITEM
S315
COUNT OPERATION TIME
S316
S317
NO
HAS STEP ENDED?
RETURN
YES
READ ITEM DISASSEMBLY DATA CORRESPONDING TO ITEM ID DATA
S318
DISASSEMBLY DIAGRAM CONSTRUCTION PROCESSING
S320
DISPLAY DISASSEMBLY DIAGRAM
S322
READ EXTERNAL IMAGE
S324

FIG. 10

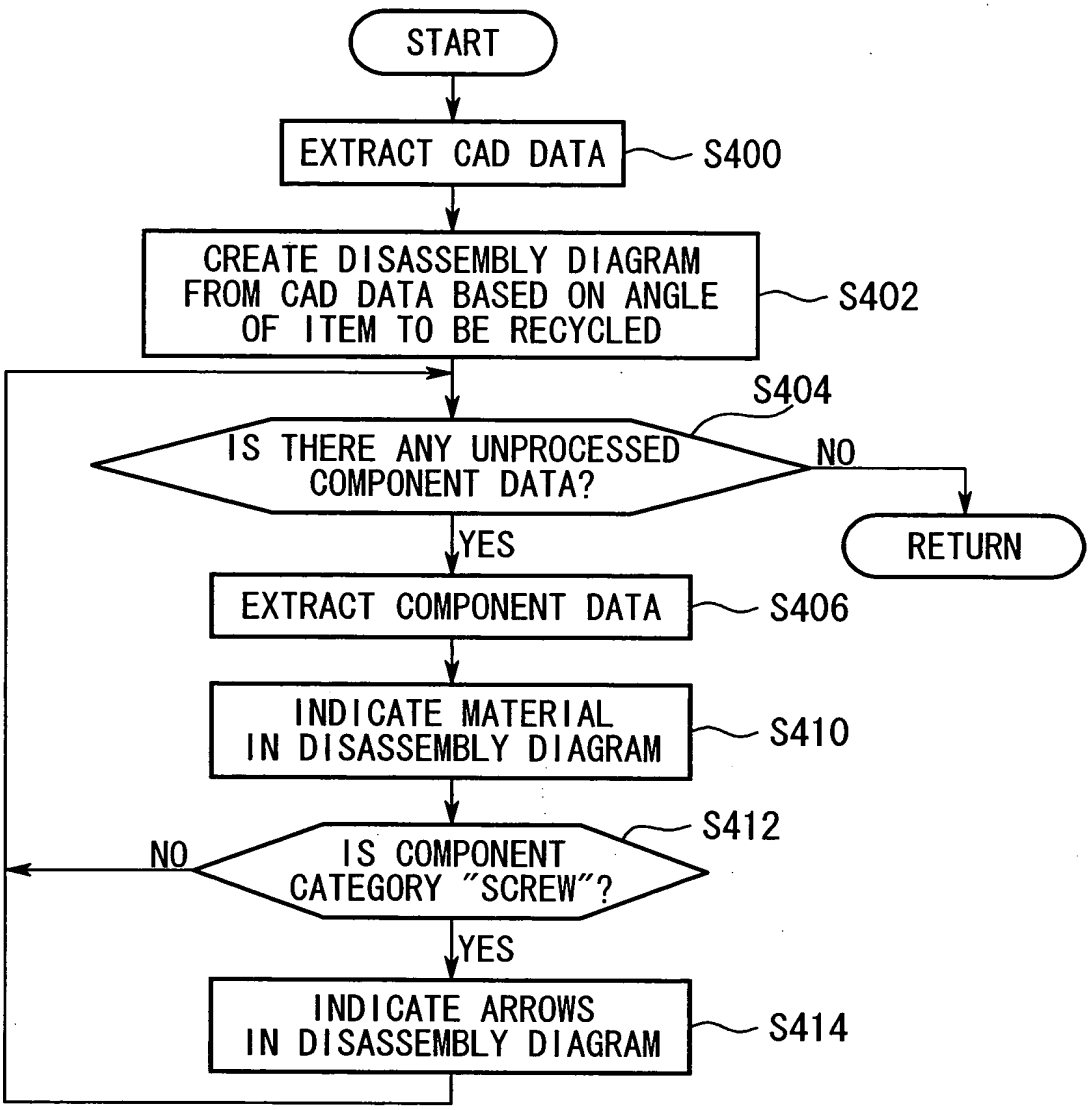
START
EXTRACT CAD DATA
S400
CREATE DISASSEMBLY DIAGRAM FROM CAD DATA BASED ON ANGLE OF ITEM TO BE RECYCLED
S402
S404
IS THERE ANY UNPROCESSED COMPONENT DATA?
NO
RETURN
YES
EXTRACT COMPONENT DATA
S406
INDICATE MATERIAL IN DISASSEMBLY DIAGRAM
S410
S412
NO
IS COMPONENT CATEGORY "SCREW"?
YES
INDICATE ARROWS IN DISASSEMBLY DIAGRAM
S414

FIG. 11

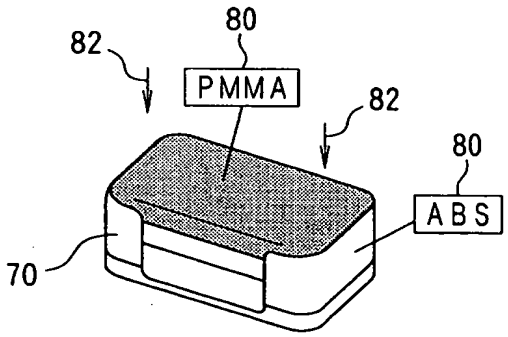
80
82
PMMA
82
80
ABS
70

FIG. 12

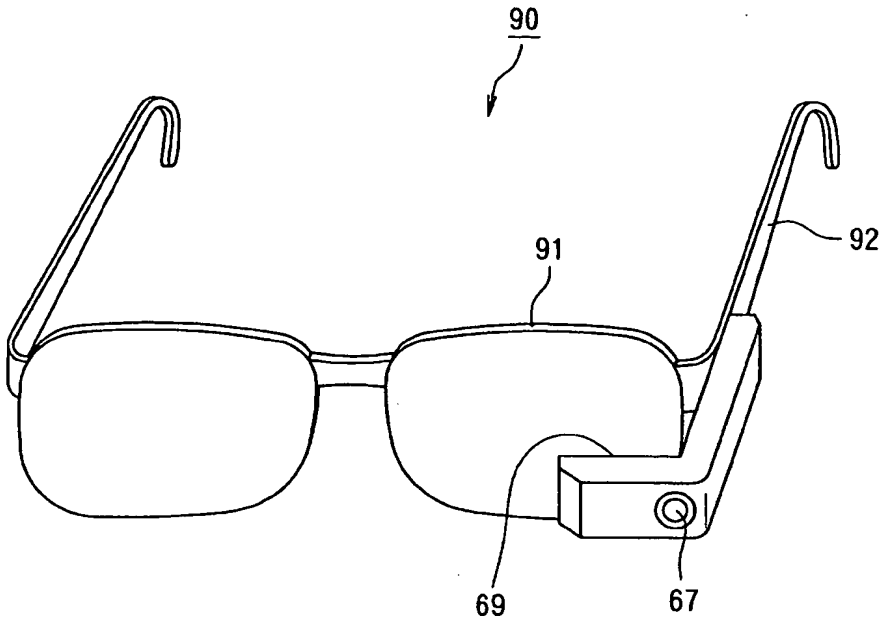
90
91
92
69
67

FIG. 13

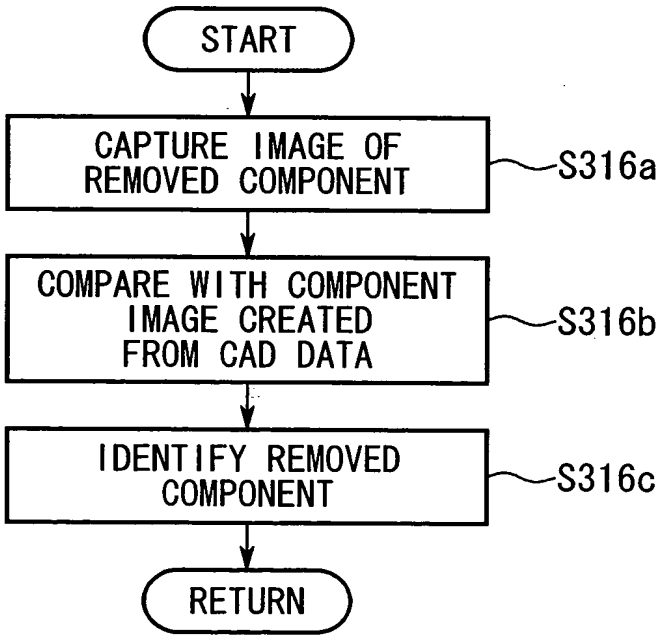
START
CAPTURE IMAGE OF REMOVED COMPONENT
S316a
COMPARE WITH COMPONENT IMAGE CREATED FROM CAD DATA
S316b
IDENTIFY REMOVED COMPONENT
S316c
RETURN

FIG. 14

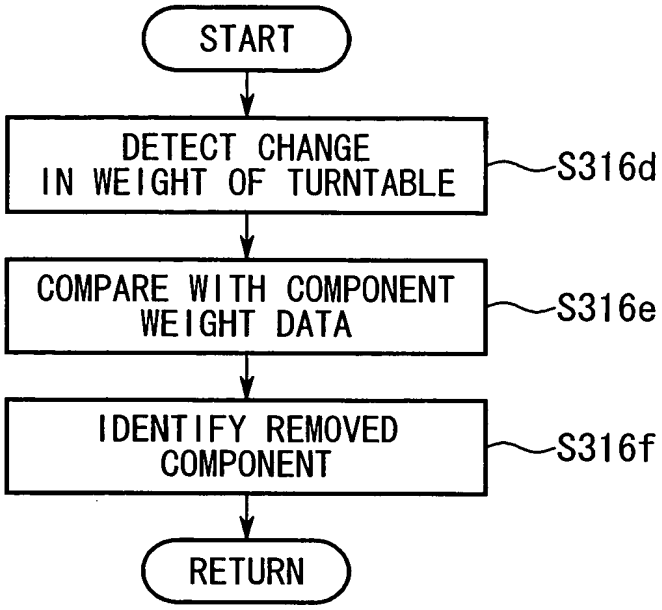
START
DETECT CHANGE IN WEIGHT OF TURNTABLE
S316d
COMPARE WITH COMPONENT WEIGHT DATA
S316e
IDENTIFY REMOVED COMPONENT
S316f
RETURN

FIG. 15

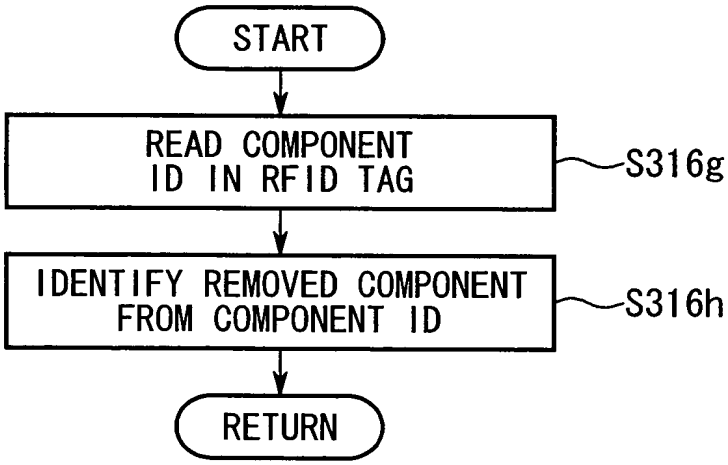
START
READ COMPONENT ID IN RFID TAG
S316g
IDENTIFY REMOVED COMPONENT FROM COMPONENT ID
S316h
RETURN

FIG. 16

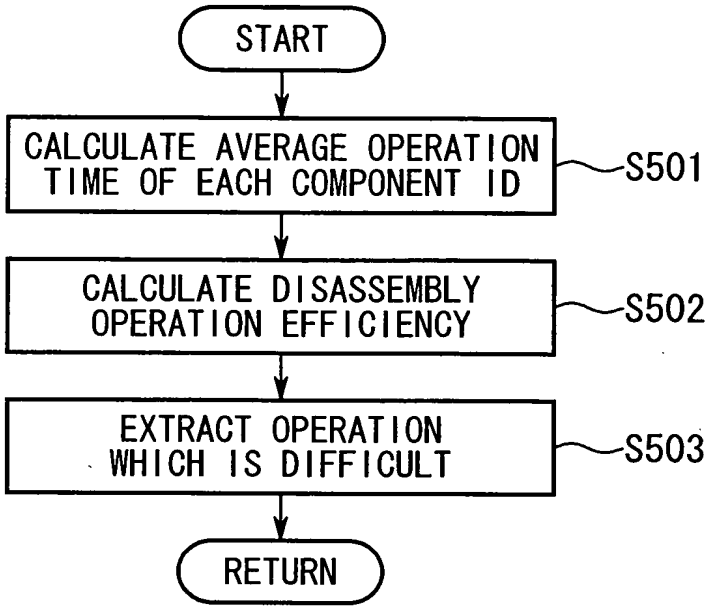

FIG. 17

DISASSEMBLY ACTUAL COMPONENT ID	ACTUAL OPERATION TIME
0001	5
0001	6
0002	40
0003	35
⋮	⋮

FIG. 18

COMPONENT ID	NECESSARY OPERATION
0001	1
0002	10, 11
0003	21, 22
⋮	⋮

FIG. 19

OPERATION ID	STANDARD OPERATION TIME (SEC)
1	5
2	10
⋮	⋮
10	15
11	20
⋮	⋮
21	10
22	30
⋮	⋮